

SUBJECT: System Safety Integration versus ATOS Compliance

Issue: The release of the Version 1.X Data Collection Tools and the transition to ATOS of the first Phase II air carrier, mark the most recent developments in the ongoing evolution of ATOS. These events have prompted some industry representatives to inquire how they can best prepare their manuals, procedures and internal structures to become “ATOS compliant”. While this question is understandable and well intentioned, it reveals that we may have become somewhat disconnected from the original intent and definition of the program. For this reason it is an appropriate time for both agency and industry personnel to revisit the concepts and principles that were integral to the program’s original mandate.

Background: In 1997, the 90-Day Safety Review directed that FAA surveillance employ a dynamic system, capable of retargeting agency resources as necessary in response to areas of identified risk.

ATOS was developed in response to this recommendation and provides a process for aviation safety inspectors to assess both regulatory compliance and system design data to identify areas of air carrier risk. The underlying philosophy of ATOS is that, in addition to regulatory compliance, the presence of certain attributes in the design, construction, maintenance, and operation of air carrier systems provides a degree of assurance that those systems are more tolerant of failures and external challenges.

ATOS provides system-based and standardized surveillance planning, data collection, and risk management tools to assist aviation safety inspectors in their oversight of air carriers. Safety attribute inspections (SAIs), which are based on specific regulatory requirements, assess the air carriers’ systems using safety attributes (responsibility, authority, procedures, controls, process measures and interfaces). Inspectors use SAIs during initial certifications, as a reference tool for evaluating air carrier program changes, and to conduct periodic audits of the air carrier’s systems. Element performance inspections (EPIs) assess the output of an air carrier’s system against established performance measures that are based on specific regulatory requirements and safety attributes. Inspectors use EPIs to determine if an air carrier follows their written procedures and controls and perform to the standards described in their manuals.

The EPI and SAI, in combination, allow the FAA to evaluate the carrier’s ability to identify, analyze, assess and control hazards and risks within the constraints of operational effectiveness, time, and cost.

Discussion: ATOS is an oversight methodology for use by inspectors, not a set of standards or processes that an operator must comply with. To suggest that an operator must comply with this oversight process is to misconstrue the intent of the system. The term “compliance” as commonly used has referred to regulatory issues. While encouraged, there is no regulatory directive for a carrier to incorporate the underlying concepts of System Safety or to reference the ATOS surveillance tools in any aspect of their operations. Air Carrier certification is based on the regulations and structures specifically outlined in 41 CFR Part 121. After initial certification, regulatory compliance is expected as a minimum standard. Even under ATOS oversight, non-compliance can result in enforcement action.

To further illustrate this point, consider this simple analogy.

An automobile manufacturer sets out to build the best product they possibly can. It is assumed that, once approved for production, the product conforms to existing regulatory specification and standards. During the design phase, the manufacturer is free to incorporate safety and functionality improvements based on past experience and research. In so doing, the manufacturer will probably produce a product that exceeds the minimum regulatory standards.

Once in service, this product is now subject to a recommended 30,000-mile inspection. This inspection is designed to assess and address problems that have developed during the operation of the product. If repairs or adjustments are necessary it does not necessarily imply that the product was faulty at its inception. Nor does it follow that, in all cases, such problems could have been designed out of the product. Conversely, the automobile manufacturer does not design and build a car simply to meet the regimen of the 30,000-mile inspection. Although it can be assumed that a well-designed product will fair better during its lifetime and need less repairs at inspection cycles.

While simplistic, this analogy attempts to make the point that ATOS is a process separate from the design phase of an air carrier operation. While operators are encouraged to incorporate System Safety concepts into their operational structures, the ATOS oversight program and the related assessment tools are not intended to be used as a mandatory checklist for the development of the final product. The audit tools developed for this task are simply that, tools used to assess the risks associated with air carrier operations. These tools were developed using a model of 'System Safety' that treats safety as a system wide process, and advises that risk be managed through a continual process of assessment, evaluation, measurement and improvement. These identified risk assessments serve as information used to direct further surveillance. In this way we create a feedback loop of information and improvement.

Conclusion: FAA does not require that an operator comply with the ATOS process, although data collection tools that were designed for this process may certainly be utilized to assist the operator in improving operational safety. ATOS supplies valuable information that allows the FAA to target agency resources toward areas of air carrier risk. Air carriers can benefit from this same information to make the internal adjustments necessary to mitigate risks as part of their internal audit or quality assurance functions.